Egypt

MINISTRY OF EDUCATION.

SCHOOL OF AGRICULTURE

REGULATIONS AND SYLLABUS

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THE SCHOOL OF AGRICULTURE, GHIZEH.

REGULATIONS.

Art. 1.

The object of the School of Agriculture shall be to provide a theoretical and practical training for those destined either for purely agricultural pursuits or for employments in which a knowledge of agriculture may be useful. Object of the School.

The School of Agriculture shall be classed among the "Special" schools under the Ministry of Education. Rank of the School.

Art. 2.

The "Code of Regulations relating to School Organisation and Discipline" issued by the Ministry of Education shall be in force in so far as it is not contrary to the present Regulations. Organisation and Discipline.

Art. 3.

The school year shall begin on the first Saturday in October and end in the month of June. Duration of School Year

Art. 4.

Candidates for admission must submit the following documents to the Principal before the commencement of Formalities of admission

the Entrance Examination, the date of which shall be announced in the *Official Journal* during the summer vacation:—

(*a*) A formal application for admission, on stamped paper (3 P.T.), together with a copy of Form No. 34 duly filled up.

(*b*) Primary Education Certificate, issued by the Egyptian Ministry of Education. In the event of there being any vacancies in the class of the first year, a limited number of applicants who do not possess this certificate may be admitted exceptionally, and on payment of a higher fee, after passing an entrance examination conducted by the Principal.

(*c*) Birth Certificate.

(*d*) A Certificate of good conduct, (*a*) from the Head of the school last attended, in the case of candidates from Private Schools; (*b*) from the competent authority, in the case of candidates educated at home.

Art. 5.

Medical Examination.

Candidates for admission must undergo a Medical Examination by the Medical Officer of the school, who shall report, in addition to the terms of Art. 70 of the Code of Regulations, whether the candidates have a sound constitution and are physically fit for active work in the field.

Art. 6.

Entrance Examination.

Candidates for admission must, in terms of Art. 67 of the Code of Regulations, pass an Entrance Examination

which shall be held at the School of Agriculture. The Entrance Examination shall be conducted by the Principal and other members of the school staff.

The date of the Entrance Examination as well as of the Medical Examination shall be announced in the *Official Journal* during the summer vacation.

ART. 7.

Candidates admitted.

The list of candidates in order of merit, together with the proposals made by the Principal for the admission of candidates as pupils of the school, shall be forwarded to the Ministry of Education immediately after the Examination. The Ministry shall decide upon the list of candidates to be admitted.

ART. 8.

Boarders and day-pupils.

Boarders as well as day-pupils shall be admitted to the School of Agriculture.

ART. 9.

Fees.

For pupils who have obtained the Primary Education Certificate the annual fee in the case of boarders shall be L.E. 40, and in the case of day-pupils L.E. 15.

For pupils admitted exceptionally without the Primary Education Certificate [Art. 4 (*b*)] the annual fee in the case of boarders shall be L.E. 50, and in the case of day-pupils L.E. 35.

In the case of boarders this fee shall cover the cost not only of board and lodging but also of instruction,

class-books and school materials, and shall likewise meet all expenses in connection with laboratory experiments. The fee for day-pupils shall secure the same advantages as in the case of boarders, with the exception of board and lodging: it shall cover, however, the cost of a midday meal.

ART. 10.

Payment of Fees.

The annual fee must be paid in advance either in one sum within the first fifteen days of the school year or by equal instalments as follows:

1st instalment: within the first fifteen days of the school year.

2nd instalment (due January 1st): not later than January 15th.

New pupils must pay the fee at the time at which they are admitted.

ART. 11.

Fees for Incomplete School Terms.

If a pupil is admitted to the school in the course of a period covered by an instalment, the whole of the instalment must be paid at the time of the pupil's admission.

Pupils admitted during the period covered by the second instalment must pay, in addition to the second instalment of the fee, the price of any books and important materials supplied to them. (Art. 76, Code of Regulations.)

Books and Materials.

Every pupil shall be assumed to have received the books and other important materials supplied to pupils in previous stages of the same Course of Study or in any antecedent Course of Study, except in the case of books

and materials that have been adopted for use since the period at which the pupil was in attendance in the class for which the article is specified as being first required. Pupils who do not possess the books and other important materials entered in the lists as required in their year of study, but which have been supplied in a preceding year either of the same Course of Study or of an antecedent Course, shall be required to purchase them. (Art. 27, Code of Regulations.)

ART. 12.

Dismissal for non-payment of Fees.

Any pupil for whom the fee has not been paid within the limits of time fixed in Art. 10 shall cease to be a student of the school. (Art. 77, Code of Regulations).

ART. 13.

Non-return of Fees.

In no circumstances and for no reason whatsoever can any fee that has been paid, or any portion of such a fee, be returned. (Art. 78, Code of Regulations.)

ART. 14.

Duration of Course of Study.

The course of study at the School of Agriculture shall extend over four years, and shall include both theoretical instruction and practical work in the field.

Before being awarded the diploma, every pupil who passes the final examination of the class of the fourth year must work for at least one year in connection with agriculture.

Art. 15.

Subjects of Study.

The subjects of instruction, the number of lessons per week, and the maximum mark in each subject shall be as follows: –

SUBJECT	Number of Lessons per Week					Maximum Mark
	First Year.	Second Year.	Third Year.	Fourth Year.	TOTAL	
Practical Work...	8	8	8	11	35	50
Agriculture...	3	3	5	6	17	
Agricultural Chemistry	...	...	4	3	7	30
Botany and Entomology	...	2	4	3	9	30
Land Surveying...	...	4	4	3	11	30
Farm Engineering	...	...	4	3	7	30
Veterinary	...	...	4	3	7	30
Book-keeping	...	...	1	2	3	20
Chemistry	5	5	...	...	10	20
Physics...	4	3	...	...	7	20
Arithmetic	3	2	...	...	5	50 (20)
Algebra	2	1	...	...	3	(15)
Geometry	1	1	...	...	2	(15)
*Arabic Language	1	1	...	...	2	20
English Language	7	4	...	...	11	20
TOTAL... ...	34	34	34	34	136	

* For pupils who have not the Primary Education Certificate, attendance at the Arabic classes shall be optional.

The detailed syllabus of the subjects of study is annexed to the present Regulations.

Art. 16.

Practical Work on the Plots and Farm.

Every pupil, on his entrance into the school, shall have one quarter of a feddan allotted to him, and this plot he shall retain during the second year of his course. He shall devote the time allowed for Practical Work,

in these years, to the cultivation of his plot, and he shall cultivate it himself without the employment of any hired labour whatsoever. Bullocks and implements for the cultivation of the plots and water for irrigation shall be supplied by the school free of charge.

Every pupil shall be allowed to dispose of the produce of his plot, subject to the approval of the Principal. In the event, however, of serious misconduct on the part of a pupil, the whole or part of the produce of his plot may be withheld from him and placed by the Principal to the credit of the school.

The pupils of the Classes of the Third and Fourth Years shall assist in the management of the Experimental Plots and School Farm, and during the hours allowed for practical work shall superintend and assist in the work connected with such experiments and shall participate in the work of the dairy, the stables, the garden and the farm generally. In addition, they shall keep farm diaries detailing the work done on the farm during the day.

ART. 17.

Examinations.

The school year shall be divided into three terms and examinations of all classes shall be held at the end of each term.

The examinations at the end of the first and second terms of all classes shall be called "Terminal Examinations." Those of the Classes of the First, Second and Third Years held at the end of the third term shall be "Examinations for Promotion to a Higher Class," and that of the Class of the Fourth Year held at the end of he third term shall be the "Diploma Examination."

ART. 18.

Boards of Examiners.

The Terminal Examinations of all classes and the Examination for Promotion of the Classes of the First and Second Years shall be conducted by the Principal and the other members of the school staff.

The Examination for Promotion of the Class of the Third Year and the Diploma Examination of the Class of the Fourth Year shall be conducted by a Board of Examiners specially appointed for this purpose by the Ministry of Education, and composed of a President and Examiners who are not members of the teaching staff of the school.

ART. 19.

Subjects of Examinations.

The examinations at the end of the school year of the second and subsequent years may include questions bearing on any of the subject matter taught in the previous years in the subject being examined.

ART. 20.

Maximum marks for examination.

The maximum number of marks awarded for the examination in each subject is indicated in Art. 15. In awarding marks for Agriculture the examiners shall take into consideration the practical work of the students during the Year.

Marks necessary for promotion to Second and Third Year Classes.

In the Examinations for Promotion at the end of the school year of the Classes of the First and Second Years, no candidate shall pass unless he shall have obtained at least 50% of the maximum number of marks for Agriculture and for each of the other subjects at least 40% of the maximum mentioned in Art. 15.

Pupils who have not the Primary Education Certificate, and who do not attend the Arabic classes, shall be exempt from examination in that subject in the Examinations for Promotion to a higher class.

Marks necessary for promotion to the Third Year Class and for obtaining the Diploma.

In the Examination for promotion at the end of the school year of the class of the Third Year and in the Diploma Examination, which shall consist of both written and oral tests, no pupil shall pass or be considered eligible for the Diploma of the school unless he shall have obtained at least 50% of the maximum mentioned in Art. 15 for Agriculture, 40% of the maximum for Agricultural Chemistry, and at least 40% of the maximum number of marks for all the other subjects taken together.

ART. 21.

Marks for good conduct and attendance.

Marks for good conduct and regularity of attendance, based upon the marks given in the course of the school year, shall be awarded at the end of the school year by the Principal. No pupil in the Classes of the First, Second and Third Years shall be allowed to pass up to a higher class unless he shall have obtained at least 20 out of the 30 marks attainable for conduct and regularity of attendance respectively. These marks shall be taken into account in reckoning up the total marks in the examination lists for all the examinations in the Classes of the First, Second and Third Years, and for the examinations at the end of the first and second terms in the Class of the Fourth Year.

ART. 22.

Award of Diploma.

Every pupil who passes the Final Examination of the Class of the Fourth Year shall be considered eligible to receive a Diploma in Agriculture from the Ministry of Education, which diploma, however, shall not be awarded

until the pupil shall have worked in connection with Agriculture for at least one year.

The results of the Diploma Examination, which is the Final Examination of the Class of the Fourth Year shall alone be considered in deciding which pupils are eligible for the Diploma of the school.

ART. 23.

President's Report. List of Marks.

The President of the Board of Examiners (Art. 18) shall forward to the Ministry of Education a report on the results of the examination of the Classes of the Third and Fourth Years, together with a list of the marks obtained by the pupils, and the Principal of the school shall forward to the Ministry the examination lists of the Classes of the First and Second Years required in terms of Art. 104 of the Code of Regulations relating to School Organisation and Discipline.

After consideration of the report and results forwarded by the President of the Board of Examiners, and the Principal of the school, and in conformity with the preceding regulations, the Ministry of Education shall decide in each case whether a pupil, if in the Class of the Fourth Year, shall be eligible for the School Diploma (Arts. 14, 20, 22), or shall remain in the same class, or shall be dismissed, and, if in the Class of the First, Second or Third Year, whether he shall be promoted to a higher class, or shall remain in the same class, or shall be dismissed.

ART. 24.

Abrogation of previous regulations.

All previous regulations and orders, in so far as they are inconsistent with the present Regulations, are hereby cancelled.

SYLLABUS.

AGRICULTURE.

First Year (3 lessons per week).

Structure of the earth, atmosphere, hydrosphere and lithosphere. Relation of the earth to the sun. Igneous and sedimentary rocks including the alluvial soil of the Nile plain and delta. Rock minerals. Weathering agents. — Agricultural Geology.

Physical properties and classification of soils. — Soils.

Plant growth. Functions of the leaves, stem and root. — The plant.

Water supply to crops: rain and irrigation water. — Water supply.

Influence of climate on plant growth. Evils resulting from abnormal climatic conditions. — Climate.

Climatology of Egypt and the crop seasons resulting therefrom.

The native and European ploughs, roller and grubber. — Implements.

The mechanical effects of tillage operations—ploughing, grubbing, harrowing, rolling, levelling, ridging, fassing, and weeding. — Tillage.

Pratique of the cultivation of cotton, berseem and wheat. — Cultivation.

Second Year (3 lessons per week).

Physical, chemical and biological properties of soils more fully considered. — Properties of soils.

Importance of rotations in the cultivation of crops. Discussion of common rotations in use. — Rotation.

Egyptian and European implements. Advantages and disadvantages of Egyptian implements and tools compared with European implements suitable for use in Egypt. Steam ploughs.

Cultivation. Cultivation of the soil, effect of tillage. Advantages of a fine deep tilth. Cost of the simpler operations on the farm.

Irrigation. Systems of irrigation practised in Egypt. Various methods of lifting water, the conditions under which they are used, and a comparison of the cost involved.

Drainage. Necessity for, and methods of, drainage in land under canal irrigation.

Reclamation of salt lands.

Third Year (5 lessons per week).

Land Improvement. Reclamation and improvement of infertile lands.

Experiments. Field experiments; their use and interpretation.

Seeds. Selection of seed for sowing purposes. Improvement of farm seeds by selection, etc.

Farm Crops. Cotton, sugar-cane, wheat, barley, rice, maize, millet, beans, lentils, chickpeas, lupines, sesame, earthnuts, berseem, vetchling, fenugreek, lucerne, sorgho, dineba, onions.

Minor Crops. Flax, samar, henna, safflower, potatoes, lettuce, etc.

Vegetables. Cultivation and marketing of the commoner vegetables grown in the country.

Trees. Planting trees for protection, fruit and timber.

Fourth Year (6 lessons per week).

Live stock General principles of breeding.

General management and uses of the various farm animals found in the country.

The modern dairy. The manufacture of dairy produce. Dairy.

The principles of poultry breeding. General management of such stock. Poultry.

Bee-keeping. Egyptian and European hives. Bees.

Land tenure in Egypt. Estate management.

General management of landed property: various systems of payment of labour.

General conditions affecting the value of agricultural land.

Capital required to successfully cultivate a given area of land.

AGRICULTURAL CHEMISTRY.

Third Year (4 lessons per week).

Its nature, general composition and functions. Mineral matter, organic matter, soil air, soil water. Important elements and forms in which these occur with special reference to nitrogen, phosphorus, and potassium. Humus. Chemical analyses and their interpretation. Composition of Nile mud and of typical Egyptian soils. Total and available plant foods. Law of minimum. Fixation of plant food. Acid and alkaline soils. Salt soils. Chemical changes occurring in land under cultivation. Gains and losses to the soil. Physical constitution of soils; soil particles. Mechanical analysis of soils. Tenacity. Coagulation of clay in soils. Shrinkage. Specific Gravity. Colour. Relation of soil to water; water capacity, power of retaining water, percolation, sources of soil water, movements of soil water, capillarity, drainage, evapora- The soil.

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tion. Relation of soil to heat; sources of soil heat; influence of latitude and aspect; soil temperatures; specific heat conduction and radiation. Influence of water on soil temperature. Biology of the soil from point of view of chemical changes effected. Bacteria of putrefaction, decay, nitrification, denitrification. Symbiotic bacteria.

The plant. Its general composition: water, organic matter, mineral matter. Essential elements and their relative importance. Sources of plant food. Organic constituents of plants. Constituents of ash of plants. Chemical processes occurring in germination, growth, and ripening of plants.

Manures. Principles of manuring. Classification of manures. Occurrence, composition and relative importance of manures found in Egypt—farmyard manure, koufri, tafl, marog, pigeon manure, and various products resulting from the disposal of sewage, refuse from abattoirs, etc. Imported manures—nitrate of soda, sulphate of ammonia, superphosphate, and other "artificial" manures.

Green manuring. Lime as manure. Manurial residues.

Laboratory Work.

Principal tests for bases and acids of agricultural importance and detection of these in presence of one another.

Combustion of plants and examination of plant ash.

Examination of soil for important ingredients.

Mechanical analysis of soils.

Experiments on soil properties—capillarity, water capacity, plant food fixation, etc.

Examination of chief manures for valuable constituents and solubility. Simple identification tests.

Fourth Year (3 lessons per week).

Chemical composition of the more important crops. Crop rotations considered from a chemical point of view. Soil exhaustion, its causes and remedies. Crop residues.

Animal nutrition.

Elements and compounds of importance in animal nutrition. Composition of the animal body, Digestion, respiration, animal heat, animal waste. Distribution and utilisation of digested food in the production of flesh, milk, bone, fat and work. Undigested food. Principles involved in the scientific feeding of animals.

Feeding stuffs.

General description and nature of cattle foods produced on the farm or manufactured. Digestibility of foods. Relation of foods to manure produced.

The Dairy.

Composition of the milk of various farm animals. Fermentation in milk. Preservation of milk. Composition of butter and cheese. Principles of their manufacture.

Laboratory Work.

Examination of chief manures for valuable constituents and solubility. Simple identification tests.

Tests for the principal organic compounds found in plants.

Examination of feeding stuffs.

Examination of milk and dairy products.

BOTANY AND ENTOMOLOGY.

Second Year (2 lessons per week).

Life history of the plant from seed to seed.

Seed structure and germination.

Root, stem and leaves considered morphologically. Common modifications of above such as tubers, bulbs, tendrils, etc.

Anatomy of the root, stem and leaf. Types of cell structure.

Nutrition of the plant. Functions of the root, stem, leaves, etc. Carbon assimilation.

Utilisation and storage of food stuffs in the plant.

Flower arrangement and nomenclature of the floral leaves. Types of flower. Fertilisation and fruit.

Inflorescence. Types and nomenclature.

Plant growth in relation to external conditions

Animal morphology. The living animal cell. Life, growth and multiplication.

A short description of the nature and use of the principal organs in mammals.

A short classification of the animal kingdom based on the morphological modifications presented by the members of the kingdom.

Third Year (4 lessons per week).

Classification A short classification of the vegetable kingdom, with special reference to cultivated plants and fungi.

Natural orders. Study from a systematic point of view of those orders

of flowering plants which are of agricultural importance —Gramineæ, Malvaceae, Leguminosae, Solanaceae, Compositae, Cruciferae, Rosaceae, Papaveraceae, Cucurbitaceae, Umbelliferae and Chenopodiaceae.

Structure and life history of typical insects to illustrate the principles of classification. Insects.

Laboratory Work

Demonstrations of plant nutrition by means of cultures in water and sand.

Examination of sections of roots, stems, leaves and flowers. Fertilisation.

Examination of seeds for stored material.

Examination of fungi.

Reference to their natural orders of plants of the above orders.

Grafting and budding, etc.

Reference of insects (larvae or imagines) to their natural orders.

FOURTH YEAR (3 LESSONS PER WEEK).

Detailed study of important economic plants.

Diseases of farm crops caused by parasitic plants. Rusts, smut, mildews, dodder, broomrape, etc. The treatment of such diseases. Plant diseases.

Insects attacking farm crops, produce and stock. Their identification, life history, eradication and natural enemies. Entomology

NOTE —As much as possible of the work in Natural Science of the class of the Fourth Year will be done in the laboratory.

LAND SURVEYING AND MENSURATION.

Second Year (4 lessons per week).

Instruments. The ordinary drawing instruments and their use. Construction of plain and diagonal scales. Plotting and offset scales; their use and selection.

Line ranging and laying off angles. Line ranging. Laying off right angles, by the chain and cross staff.

Plotting, etc. Plotting to scale from field notes. Taking out areas.

Chain surveying. Practical chain surveying in the field, and simple problems in mensuration

Use of Kassaba.

Third Year (4 lessons per week).

Prismatic compass. Use of the prismatic compass.

Plane table. Plane table surveying.

Levelling. General principles of levelling.

Plotting sections from field books. Simple and compound levelling, and the making of cross sections.

Mensuration treated as far as possible graphically. Methods of finding lengths of circular arcs, areas of sectors and segments of circles, volumes of grain and earth heaps, and capacities of tanks, and canals.

Fourth Year (3 lessons per week).

General principles. Recapitulation of the previous year's course.

Plane table surveying and levelling.

Students will make plans of simple areas of land.

Laying out of farm roads, canals and drains. General arrangement and maintenance.

FARM ENGINEERING.

Third Year (4 lessons per week).

Friction, lubrication, and efficiency. Transmission of power. — Machines

Fuels and their uses. — Fuel.

Generation of steam. — Steam.

Steam engines, oil engines, gas engines, hot-air engines. Horse power. Meaning of N.H.P., I.H.P., B.H.P. Measurement of B.H.P. — Engines.

Commoner forms of pumps in use in Egypt. Power required to work them under varying conditions. — Pumps

Elementary ideas on fluid frictions. — Fluid friction.

Slopes of canals and drains. Methods employed in measuring the discharge of water. Flow of water in open and closed channels. Carrying capacity of canals and drains. Dimensions of canals and drains for given areas of land. — Flow and discharge of water.

Construction, cost and working of Egyptian water-lifting machines. Conditions under which they are employed. — Egyptian water-lifting machines.

General construction and principles of working of implements and machines used on the farm Steam ploughing machinery. Harvesting and thrashing machinery. Flour Mills. Portable railways. Minor implements worked by animal traction. Food preparing machines. Dairy machinery. Cotton gins and presses. — Agricultural machinery.

Fourth Year (3 lessons per week).

Recapitulation of the Third Year's work.

General characteristics and properties of materials used in the construction of farm buildings. Timber, market — Materials.

sizes and cost. Preservation of timber. Building stones found in the country. Air-dried and burnt bricks, their manufacture and cost. Cement. Preparation of lime, mortar, homra, and concrete.

Principles of construction. General principles of masonry, brick-work and carpentry.

Wells. Sinking of wells.

Fencing. Wood and iron fencing. Mode of erection and cost.

Plans and estimates. Plans and estimates for farm buildings and simple structures required on the farm as bridges, foundations for pumps, etc.

Legislation. Existing legislation relating to the construction of esbehs and other buildings in connection with the farm.

VETERINARY.

Third Year (4 lessons per week).

Anatomy and physiology. Anatomy and physiology of farm animals briefly considered.

Digestion & nutrition. Digestive processes and principles of nutrition. General knowledge of the blood and its circulation, and the processes of respiration, secretion, and excretion.

Dentition. Dentition of farm animals as indicative of age.

Health. Signs of health in the different animals.

Pregnancy. Periods of gestation and signs of pregnancy in farm animals. Special management of these animals prior to, at the time of, and after parturition. Abortion.

Fourth Year (3 lessons per week).

Management. The management of farm stock in health and disease.

Diseases. The commoner diseases to which farm animals are

liable in Egypt; their causes, symptoms and treatment.

Parasites attacking farm animals. General treatment.

General sanitary measures to be adopted in cases of outbreaks of infectious diseases.

Treatment of wounds and abscesses. Treatment.

Ordinary drugs and their employment.

Practical Work.

Students will as far as possible, treat animals suffering from wounds and disease.

BOOK-KEEPING.

Third Year (1 lesson per week).

Principles of book-keeping.
Day-book, journal, and cash-book.
Valuation of live stock and effects.
Profit and loss account.

Fourth Year (2 lessons per week).

Book-keeping with special reference to farm accounts.
Ledger accounts.
Assets and liabilities.
Cheques, bills, etc.
Balance sheet.

CHEMISTRY.

First Year (5 lessons per week).

Laboratory work according to requirements of class.

Introductory physics.

Matter and energy. Weights and measures.

Density and specific gravity.

The atmosphere and the barometer. The thermometer.

Boyle's and Charles' Laws.

Current electricity. The simple cell. Chemical effects of currents,

Solution. Diffusion. Dialysis. Osmosis, etc.

Inorganic Chemistry.

Chemical and physical changes.

Elements. Metal and non-metals. Mixtures and compounds.

Laws of chemical combination.

Atoms and molecules. Avogadro's Law.

Symbols. Formulae. Chemical equations.

Hydrogen. Oxygen and water. Natural waters.

Oxides and hydrates. Bases and acids. Salts.

Nitrogen and the atmosphere.

Compounds of nitrogen. Ammonia. Nitric acid and nitrates.

Chlorine. Hydrochloric acid and chlorides.

Carbon. Carbon Monoxide. Carbon Dioxide and Carbonates.

Sulphur. Sulphuretted Hydrogen and Sulphides.

Sulphurous and Sulphuric Acids and their salts.

Phosphorus. Phosphoric Acid and phosphates.

Chemical arithmetic.

Second Year (5 lessons per week).

Laboratory work according to requirements of class.

Inorganic Chemistry.

Revisal of first year's work.

Silica and silicates.

The principal metals and their more important compounds.

Organic Chemistry.

Introduction.

The hydrocarbons. Paraffins. Ethylene. Acetylene.

Coal gas and its preparation.

Alcohols. Aldehydes and acids. Fermentation.

Fats. Soaps and glycerine.

Oxalic, Tartaric, Citric and Lactic Acids.

The Carbohydrates

Cyanogen compounds. Urea.

The aromatic compounds. Benzene. Phenol.

The albuminoids. Alkaloids.

Chemical arithmetic.

PHYSICS.

First Year (4 lessons per week).

Laboratory work according to requirements of class.

Properties of matter.

Matter. States of matter. Divisibility. Porosity. Cohesion. Compressibility. Weight. Distinction between mass and weight. Inertia.

Heat.

Difference between heat and temperature. Thermometers. Construction and graduation of the Centigrade and Fahrenheit thermometers. Maximum and minimum thermometers.

Expansion of solids, liquids and gases.

Specific heat and calorimetry. Determination of specific heats by (1) method of mixtures and (2) method of fusion of ice.

Fusion. Melting points. Latent heat of fusion.

Freezing mixtures. Expansion of water on freezing.

Vaporisation. Evaporation and boiling. Vapour presssure. Boiling points and influence of pressure on boiling point. Latent heat of vaporation. Freezing by evaporation.

Conduction. Comparison of conducting powers of different solids. Action of wire gauze on flame. Safety lamp. Conduction in liquids and in gases.

Convection. Convection in liquids. Heating by hot water. Convection in gases.

Radiation. Reflection. Absorptive power.

Emissive power. Diathermancy.

Second Year (3 lessons per week).

Laboratory work according to requirements of class.

Mechanics.

Velocity. Parallelogram of velocities. Polygon of velocities. Resolution of a velocity into two components in two given directions.

Acceleration. Formulae for motion of a body moving in a straight line with uniform acceleration. Acceleration due to gravity.

Mass and momentum.

Parallelogram of forces, polygon of forces, parallel forces, moment of a force about a point.

Centre of gravity of a body and its position in simple cases. Stable, unstable and neutral equilibrium.

Work. Unit of work. Power. Unit of power. Definition of energy. Distinction between kinetic and potential energy.

Levers. Pulleys. Wheel and axle.

Hydro-statics.

Transmission of pressure. Pressure at any point of a liquid acted on by gravity.

Determination of specific gravity of solids and liquids by (1) the balance (2) the specific gravity bottle and (3) Nicholson's hydrometer.

Hydraulic Press. Syphon. Suction pump. Force pump. Atmosphere. Barometer.

ARITHMETIC.

First Year (3 lessons per week).

Whole numbers.

Addition, subtraction, multiplication and division. G. C. M. and L. C. M. (1) by factors, (2) by an operation when factors are not readily obtainable.

Vulgar fractions.

Vulgar fractions. Reduction to lowest terms and reduction of several fractions to a common denominator. Addition, subtraction, multiplication and division. Complex fractions.

Decimal fractions.

Decimal fractions. Conversion of decimals to vulgar fractions and vice-versa. Addition, subtraction, multiplication and division of decimals. Recurring decimals, their origin and conversion to vulgar fractions. Addition and subtraction.

Money, weights and measures.

Egyptian money, weights and measures. English and metric money, weights and measures in so far as they are used in Egypt. Addition, subtraction, multiplication

and division of the above money, weights and measures. Interconversion of the three systems.

Time and the calendars (Gregorian, Coptic and Arabic).

SECOND YEAR (2 LESSONS PER WEEK).

Ratio and proportion. Unitary method. Compound rule of three.

Squares and square roots.

Questions involving time and work.

Percentages. Simple interest. Bankers' discount. Compound interest.

Profit and loss.

Mixtures. Proportional parts. Partnerships.

Simple mensuration.

ALGEBRA.

FIRST YEAR (2 LESSONS PER WEEK).

Definitions and explanations of algebraical signs and terms. Numerical substitutions. Positive integral indices.

Addition, subtraction, multiplication and division of algebraical expressions.

Brackets.

Simple equations of the first degree in one unknown, and problems producing them.

SECOND YEAR (1 LESSON PER WEEK).

Algebraical fractions whose terms are monomials; their addition, subtraction, multiplication and division.

Simple equations of the first degree in two unknowns, and problems producing them.

GEOMETRY.

First Year (1 lesson per week).

Definitions, axioms and postulates.
Angles at a point.
Triangles.

Second Year (1 lesson per week).

Parallels and parallelograms.
Problems.

ARABIC LANGUAGE.

(a) *Pupils who have obtained the Primary Education Certificate.*

Note.—The third book of Grammar used in the 4th Primary Year should be kept under revision throughout the whole of the course.

First Year (1 lesson per week).

1.—Specificative, numerative and their forms.
2.—Reading and explanation in the book "Kalilah wa Dimnah." The style of the book should be discussed and studied.
3.—Essays on at least ten different subjects.

Second Year (1 lesson per week).

1.—Eloquence and style.
2.—As in First Year.
3.—As in First Year.

N.B.—*a.* Pupils should in all Years be exercised in applying the rules. Exercises should be written in books and marked by the teacher.
b. Composition exercises should be graduated according to the various classes. Many of them should be on subjects concerning agriculture.
c. In all the written work correct spelling must be carefully observed
d. Pupils of all classes should be taught how to use dictionaries.
e. Other reading books should occasionally be used.

(b) *Pupils who have not obtained the Primary Education Certificate. (Europeans).*

First Year (1 lesson per week).

Reading from an Arabic reading book.
Composition. Reproduction of short stories.

Second Year (1 lesson per week).

Continuation of the course of the First Year, proceeding on the same plan and with the same object in view.

ENGLISH LANGUAGE.

First Year (7 lessons per week).

Words and Phrases. Pronunciation. Acquisition of words and phrases. Dictation.

Grammar. Elementary Grammar. Translation. Parsing and analysis.

Composition. Composition; forming sentences as answers to questions dictated or otherwise: reproduction of short stories read or from given outline.

Conversation Conversation.

Second Year (4 lessons per week).

Dictation and Spelling. Dictation, seen and unseen. Spelling exercices.

Grammar. Grammar, more fully treated. Translation. Exercises in syntax and more advanced analysis.

Composition. Composition, narratives and letters on familiar subjects.

Conversation Conversation.

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